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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,248	03/12/2004	Brian Francis Gray	9194	8206

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THE PROCTER & GAMBLE COMPANY
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EXAMINER

DAHIMENE, MAHMOUD

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/799,248

Applicant(s)

GRAY ET AL.

Examiner

Mahmoud Dahimene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pozniak (US 4136615) in view of Yang et al. (US 20040077178).

Pozniak discloses a pattern plate of composite structure and describes a method for making the pattern plate. The method comprising:

- a metal sheet (Column 2, line 56)
- conventional photoresist (Column 2, line 62) which is initially uncured before applied to the metal sheet.
- a mask having opaque and light transparent bands (Column 4, line 64)
- a light curing means (Column 2, line 38)
- Providing an acid (Column 5, line 5)
- Providing a caustic (Column 6, line 30)
- The exposed surface of the metal sheet is coated in a conventional manner with poly(vinyl cinnamate) photoresist (Column 6, line 8)
- The metal sheet is exposed to light through a negative having opaque non-image areas (Column 6, line 12) which reads on disposing a mask between the layer of photoresist and the light curing means, and exposing the

photoresist through the mask means to cure the portions in register with transparent regions.

- And the metal sheet is etched with an acid (Column 6, line 14), a caustic is used. As to the step of rinsing or washing away the acid from the etch step, Pozniak discloses a caustic is used to neutralize pH.

A difference is noted between applicants claim 1 and the reference of Pozniak, Pozniak does not disclose a step where photoresist polymer is further applied to the upper surface and side wall of the at least one protrusion.

Yang et al. disclose a method for laterally etching a semiconductor structure where a mask (222) is applied to an electrode for subsequent etch step. The polymeric mask (222) protects the upper portion of the side walls (220) and the upper surface (214) of the electrode (206) (page 3, paragraph 37) and (figure 2B). It is noted that in this particular case the gate structure (which is a protrusion) is not a metal but a conductor, and the polymeric film is not a photoresist polymer. The intension, in Yang's reference, is to etch an undercut or notch under the gate structure, however, the disclosed method clearly provides a method for mask protecting the upper surface and side walls of a structure for allowing an additional etch step to further etch the structure with control of the side walls profile (in this case undercut).

Therefor it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a step to the method of the reference of Pozniak, as described above, this step, as taught by Yang consists of applying a polymer mask to cover the upper surface and side walls of the at least one protrusion to further etch

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higher aspect ratio of the protrusion with control of the profile, because, with proper etch control, the method of Yang allows to etch high aspect ratio protrusion if needed, the applied mask covers the already etched top of the structure for further etching to increase the aspect ratio, the subsequent etch profile could be undercut, tapered or straight depending on the etch time and conditions. Using a photoresist mask instead of the cited polymeric mask would have been an obvious modification because photoresist is a masking material conventionally used in semiconductor manufacturing processes such as the one disclosed by Pozniak.

One of ordinary skill in the art would have been motivated to add the step taught by Yang to etch high aspect ratio structures because this method potentially allows etch of high aspect ratio structures without the need for highly anisotropic etching means.

As to the step of rinsing or washing away the acid from the etch step, Pozniak discloses a caustic is used to neutralize pH. It would have been obvious to one of ordinary skill in the art to use a caustic to neutralize the acidic residue from the metal plate, because, after the etch step, the etch process needs to be effectively stopped, rinsing with an acid neutralizer is not uncommon in the art of wet etching.

As to claim 2, if a 2 step etch process is used to obtain a higher aspect ratio structure or protrusion (with the desired profile) than a one step etch process, it would have been obvious to one of ordinary skill in the art to repeat the process three or more times to obtain a yet higher aspect ratio of at least about 1.

With respect to claim 5, the limitation of the suitability of the forming structure of claim 1 for use in an apparatus for making formed polymeric film is considered to be an

intended use limitation which does not distinguish the final structure which is produced by the combination of references of Pozniak and Yang, since the final structure produced by the combination of references of Pozniak and Yang is the same as that defined in applicants claims, the final structure would have the capability for use in an apparatus for making polymeric film.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pozniak (US 4136615) in view of Yang et al. (US 20040077178) as applied to claims 1 and 2 above, and further in view of Luthje et al. (US 20010021419).

The modified method of Pozniak, as described above does not include a printing apparatus for applying photoresist on the protrusions. Luthje discloses a method for applying photoresist to a base body surface, the method makes use of a pointed source device in the form of a pulse printing device to apply photoresist on a surface (page 6, paragraph 74). The apparatus allows different profiles of photoresist (51) to be applied to a surface (42) (figures 4 and 5).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to use the printing apparatus of Luthje to apply photoresist on the upper surface and side wall of at least one protrusion, because the printing apparatus of Luthje would conceivably allow deposition of photoresist with specific profiles, shapes and precise locations such as protrusions. One of ordinary skill in the art would have been motivated to use the printing apparatus of Luthje for this task because conventional methods such as uniform coating are not suited for this three dimensional

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application, a more selective deposition method, that allows a choice of profiles and shapes of selectively deposited photoresist, is therefor needed.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pozniak (US 4136615) in view of Yang et al. (US 20040077178) and Luthje et al. (US 20010021419) as applied to claim 3 above, and further in view of Ichinose et al. (US 5688366)

The modified method of Pozniak, as described above, fails to include flexographic printing as the printing apparatus.

Ichinose discloses an etching method for producing a semiconductor device where flexographic printing is suggested as a means to coat a surface with photoresist (column 1, line 66).

Therefor it would have been obvious to one of ordinary skill at the time the invention was made to use flexographic printing because the method allows the possibility of selectively applying photoresist on the top and side walls of structure with precision where conventional uniform coating cannot be utilized.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pozniak (US 4136615) in view of Yang et al. (US 20040077178) as applied to claims 1 and 2 above, and further in view of Saksa et al. (US 20030185971).

The modified method of Pozniak does not include a photoresist mask achieved via a printing process.

Saksa discloses a method for ink jet printing circuit wherein the conductive structures of the printed circuit board may be applied by using, for example, screen-printing or photographic methods, e.g., applying photoresist exposing, and developing (page 1, paragraph 3). It is noted that Saksa does not discuss the particular structure claimed by the applicant, however, Saksa discloses applying photoresist via a printing process.

Therefor, it would have been obvious use a printing process to dispense the photoresist mask in the modified method of Posniak because applying a continuous uniform layer of photoresist on top of a mesh structure, similar to the one shown on applicants figure 1, is more difficult to achieve than on a flat surface. Photoresist thickness uniformity is harder to near the corners of the upper surface of the mesh structure because the fluid will tend to accumulate or overflow depending on the coefficient of viscosity. One of ordinary skill in the art would have been motivated to use a printing process because the printing screen could be aligned with the mesh structure to selectively deposit photoresist a distance from the top corners to insure photoresist thickness uniformity.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahmoud Dahimene whose telephone number is (571) 272-2410. The examiner can normally be reached on week days from 8:00 AM. to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mahmoud Dahimene
MD

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER

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